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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PATEL, SHEFALI D

ART UNIT PAPER NUMBER

2621

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/669,395	<b>Applicant(s)</b> ARGIRO ET AL.	
	<b>Examiner</b> Shefali D. Patel	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2004.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 10-32, 35 and 37-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 10-14, 28-32 and 35 is/are rejected.
- 7) ☒ Claim(s) 15-27 and 42-54 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. The amendment was filed on November 6, 2004.
2. Claims 1-5, 7, 10-32, 35, and 37-54 are pending in this application.
3. Claims 6, 8-9, 33-34, and 36 have been cancelled.

### *Response to Arguments*

4. Applicant's arguments filed on November 6, 2004 (Remarks on pages 14-15) with regards to claims 10-13 and 37-40 have been fully considered but they are not persuasive. Applicant argues on page 15 stating:

“the cardiac cycle signal is derived from the ECG data, and not from the plurality of scanned images as recited by the Applicant's claims.”

The examiner disagrees.

Please note that Heuscher discloses CT scanner 10, which scans plurality of images that are outputted to ECG monitor 60, which acquires the cardiac signal. See, col. 3 line 3 for CT scanner 10, col. 4 lines 29-34 for ECG monitor 60, col. 8 lines 58 to col. 9 lines 1-3 for scan controller 90.

5. Applicant's arguments on pages 15-16 with regards to 103 rejection have been fully considered but they are not persuasive. Applicant argues on pages 15-16 stating:

“the three base criteria to establish a *prima facie* case of obviousness must be met and that the examiner does not meet these bases (emphasis added by the examiner).”

The examiner disagrees.

The examiner has provided motivation for the combination, reasonable expectation of success, and the prior art of reference teach or suggest all of the claim limitations. See the rejection below. The examiner will simplify the details in the following 103 rejections if she was not clear in the previous office action. Nonetheless, the *prima facie* in the previous action had no defect and has been established correctly.

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6. Applicant's arguments, see Remarks on pages 12-14, filed on November 6, 2004, with respect to the rejection(s) of claim(s) 1-2, 7-8, 28-29, and 34-35 under 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Giger et al. (US 5,133,020).

*Claim Rejections - 35 USC § 102*

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 10-13 and 37-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Heuscher et al. (US 6,510,337) (hereinafter, "Heuscher").

With regard to **claim 10** Heuscher discloses a cardiovascular system comprising: receiving from an image scanner (CT scanner 10, col. 3 line 3) a plurality of image recorded over a period of time (See, col. 3 lines 49-57 and col. 4 lines 1-7), the images representing one or more locations along the extent of the cardiovascular system (the radiation detectors 40 around the periphery of the examination region 14 to capture images from more than one location of the patient 32 as seen in Figure 1 and at col. 3 lines 23-35); deriving a cardiac cycle signal from the plurality of scanned images (the data acquired by the CT scanner 10 are processed by an image processor 50 and generates images ("preferable, of the patient's heart and/or surrounding anatomy") from the views or data lines and this information is being further processed by video processor 54 and send to display 56 for human-viewable format, See col. 4 lines 8-29. The ECG monitor also acquires EDG data from the patient 32 as seen in Fig. 1 and at col. 4 lines 29-34. See Figure 2 for a cardiac cycle signal from times t1 through t4, col. 4 lines 34-44); and assigning a phase

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in the cardiac cycle to each scanned image (times t1 through t4 correspond to and assigns a phase in the cycle to each part of the image at col. 4 lines 45-67 to col. 5 lines 1-4).

With regard to **claim 11**, Heuscher discloses the method of claim 10, wherein the portion of the cardiovascular system is the heart (See col. 4 lines 15-17).

With regard to **claim 12** Heuscher discloses the method of claim 10, wherein the image scanner is a CT scanner (col. 3 line 3).

With regard to **claim 13** Heuscher discloses the method of claim 10, wherein the image scanner is a MRI scanner (See, col. 1 lines 8-15).

**Claim 37** recites identical features as claim 10 except claim 37 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 10 is equally applicable to claim 37. Heuscher discloses computer-readable medium as seen in Fig. 1.

**Claim 38** recites identical features as claim 11 except claim 38 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 11 is equally applicable to claim 38.

**Claim 39** recites identical features as claim 12 except claim 39 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 12 is equally applicable to claim 39.

**Claim 40** recites identical features as claim 13 except claim 40 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 13 is equally applicable to claim 40.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 1-2; 7, 28-29, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheehan et al. (hereinafter, "Sheehan") (USPN 5,533,085) in view of Giger et al. (hereinafter, "Giger") (US 5,133,020).

With regard to **claim 1**, Sheehan discloses a method for selecting images of a portion of a cardiovascular system (Note, Sheehan discloses an angiograph system where cardiac cycles are obtained. According to the Merriam-Webster's Dictionary ®, both angiography and cardiovascular is an analysis of the blood vessels.) comprising:

receiving from an image scanner a plurality of images recorded over a period of time (see for example, col. 5 lines 47-62, where Sheehan discloses a detector 30 in which image intensifier 32 and video camera 38 is included to record images over a period of time, also shown in Fig. 1.), the images representing one or more location along the extent of the cardiovascular system (col. 7 lines 17-18 where different viewing angles of the heart is being monitored); and

selecting at least a subset of the images based on common criteria determined from the plurality of images (at col. 7 lines 15-17, Sheehan states: "it should be noted that the software can be used to select images occurring either before or after end systole and end diastole and that the term "specific image" as used in this specification and in the claims that follow is intended to encompass any image referenced by *predefined criteria* (emphasis added by the examiner) relating to portions of the cardiac cycle." What this means is that, Sheehan selects any image, which obviously includes portion of the images, according to a predetermined criteria; and furthermore Sheehan selects the subset of the image, see col. 8 lines 3-5 and col. 9 lines 28-34.) The frames are selected for end systole and end diastole and without reference to an external signal (it is clearly noted at col. 7 lines 19-25 that a reference to an external signal is not made as Sheehan uses a medical practitioner instead of an EKG monitor).

Sheehan discloses determining the difference between pixel values within the row and column. However, Sheehan does not expressly disclose determining the blurriness by difference between the

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image and an adjacent image. Giger discloses this in Method B at col. 12 lines 11-32. Sheehan and Giger are combinable because they are from the same field of endeavor, i.e., Medical Imaging. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Giger with Sheehan. The motivation for doing so is to define the blurriness to determine malignancy as suggested by Giger at col. 12 lines 11-32. Therefore, it would have been obvious to combine Giger with Sheehan to obtain the invention as specified in claim 1.

With regard to **claim 2**, Sheehan discloses the method of claim 1, wherein the portion of the cardiovascular system is the heart (See col. 5 lines 33-34).

With regard to **claim 7** Sheehan discloses a method wherein the blurriness of the image is determined by a Fourier transform (hereinafter, "FT") applied to the image. Sheehan applies FT to the image (See col. 14 lines 58-63). The blurriness of the image is obtained from here because Sheehan states: "The exact total edge length in the block can be estimated by summing all of the frequency components for the block." As mentioned before in claim 1, the total edge length is used in selecting a subset of the image. Furthermore, Giger also discloses FT to obtain the blurriness of the image at col. 12 lines 33-58.

**Claim 28** recites identical features as claim 7 except claim 28 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 7 is equally applicable to claim 28. Sheehan discloses computer-readable medium (See col. 6 lines 40-67, also shown in Fig. 1).

**Claim 29** recites identical features as claim 2 except claim 29 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 29.

**Claim 35** recites identical features as claim 1 except claim 35 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 35.

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11. Claims 3-4 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheehan in view of Giger as applied to claims 1-2, 7, 28-29, and 35 above, and further in view of Heuscher.

With regard to **claim 3**, Sheehan (modified by Giger) discloses all of the subject matter recited in claim 1 as already discussed above and the arguments are not repeated herein, but are incorporated by reference. Sheehan does not expressly disclose image scanner being a CT scanner. However, Heuscher discloses the image scanner being a CT scanner 10 at col. 3 line 3 and in Figure 1. Sheehan, Giger and Heuscher are combinable because they are from the same field of endeavor, i.e., medical imaging. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Heuscher with Sheehan and Giger. The motivation for doing so is to allow acquiring the images as suggested by Heuscher with the advantages of identifying a cardiac phase for a patient more accurately and reliable where a particular phase of the heart might be studied more closely for a certain abnormality at col. 8 lines 22-27. Therefore, it would have been obvious to combine Heuscher with Sheehan and Giger to obtain the invention as specified in claim 3.

With regard to **claim 4** Heuscher discloses the image scanner is a MRI scanner (See, col. 1 lines 8-15).

**Claim 30** recites identical features as claim 3 except claim 30 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 30.

**Claim 31** recites identical features as claim 4 except claim 31 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 4 is equally applicable to claim 31.

12. Claims 5 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheehan in view of Giger as applied to claims 1-2, 7, 28-29, and 35 above, and further in view of Hunziker (US 5,910,111).



With regard to **claim 5** Sheehan (modified by Giger) discloses all of the subject matter recited in claim 1 as already discussed above and the arguments are not repeated herein, but are incorporated by reference. However, Sheehan does not expressly disclose the image scanner being an ultrasound scanner. It would have been obvious matter of design choice to modify the Sheehan reference by having ultrasound scanner since applicant has not discloses that having an ultrasound scanner solves any stated problem or is for any particular purpose and it appears that the ultrasound scanner would perform equally well with the image detector (as disclosed in Sheehan and claim 1 above).

Please note that Hunziker discloses ultrasound scanner as the image scanner at col. 2 lines 62-66. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Hunziker with Sheehan and Giger. The motivation for doing so is to allow acquiring the heart motion image data as suggested by Hunziker at col. 2 lines 63-66. Therefore, it would have been obvious to combine Hunziker with Sheehan and Giger to obtain the invention as specified in claim 5.

**Claim 32** recites identical features as claim 5 except claim 32 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 5 is equally applicable to claim 32.

13. Claims 14 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heuscher in view of Hunziker (US 5,910,111).

With regard to **claim 14** Heuscher discloses all of the subject matter recited in claim 10 as already discussed above and the arguments are not repeated herein, but are incorporated by reference. However, Heuscher does not expressly disclose the image scanner being an ultrasound scanner. It would have been obvious matter of design choice to modify the Heuscher reference by having ultrasound scanner since applicant has not discloses that having an ultrasound scanner solves any stated problem or is for any particular purpose and it appears that the ultrasound scanner would perform equally well with the image detector (as disclosed in Heuscher and claim 10 above).

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Please note that Hunziker discloses ultrasound scanner as the image scanner at col. 2 lines 62-66. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Hunziker with Heuscher. The motivation for doing so is to allow acquiring the heart motion image data as suggested by Hunziker at col. 2 lines 63-66. Therefore, it would have been obvious to combine Hunziker with Heuscher to obtain the invention as specified in claim 14.

**Claim 41** recites identical features as claim 14 except claim 41 is a computer-readable medium claim. Thus, arguments similar to that presented above for claim 14 is equally applicable to claim 41.

*Allowable Subject Matter*

14. Claims 15-27 and 42-54 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The reasons for indicating allow matter are disclosed in an Office Action mailed on May 5, 2004 and the reasons are not repeated herein, but are incorporated by reference.

*Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

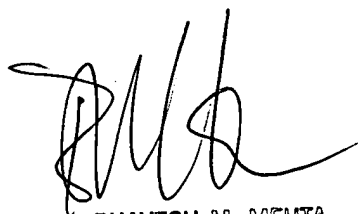
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D. Patel whose telephone number is 571-272-7396. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 5, 2005

Shefali D Patel  
Examiner  
Art Unit 2621



**BHAVESH M. MEHTA**  
**SUPERVISORY PATENT EXAMINER**  
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